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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, LUONG TRUNG

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/806,252

Applicant(s)

IDDAN ET AL.

Examiner

LUONG T. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 28-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 27 is/are rejected.
- 7) ☒ Claim(s) 5-26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-4, 27 filed on 10/17/2005 have been considered but are moot in view of the new ground(s) of rejection.

In re page 9, Applicants argue that Kozlowski et al. (US 111) does not teach a pixel comprising a circuit having either a feedback capacitor separate from the light sensitive element. Fig. 1 and column 1, lines 30-33 respectively show and discuss a capacitor, which is outside of the pixel circuit, is common to a plurality of pixels and is comprised in "the 'column' buffer servicing each bus" (column 1, line 29).

In response, regarding claim 2, the Applicants recited limitation "the circuit comprises a feedback capacitor separate from the light sensitive element connected between the input and output of each of the at least one amplifier," and note that claim 2 does not require the capacitor is inside of the pixel circuit; therefore, the Examiner considers that Kozlowski et al. still disclose "a pixel comprising a circuit having a feedback capacitor separate from the light sensitive element," as disclosed in Figure 1 and Column 1, Lines 30-33). The PTO must give claim words their broadest reasonable meaning in their ordinary usage, as understood by one of ordinary skill in the art. *In re Morris*, 127, F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yahav et al. (U. S. Patent No. 6,057,909) in view of Riches (U. S. Patent No. 6,157,409).

Regarding claim 1, Yahav et al. discloses a 3D camera for determining distances to regions in a scene (optical ranging camera 110 or 240 produces a three-dimensional digital image, Column 12, Lines 22-35, Figures 10, 17A) comprising:

a photosurface (detector matrix array 241, Figure 17A, Column 25, Lines 5-15) having plurality of pixels (plurality of detector elements 242, Figure 17A, Column 25, Lines 5-15) each of which comprises a circuit having single light sensitive element that provides a current responsive to light incident thereon and wherein the circuit is controllable to modulate or gate the current (each detector element 242 provides a current in response to light incident thereon, and is controlled by controller 126 and video processor 116, Figure 17A);

a light source (light source 40, Figure 17A, Column 12, Lines 52-60);

a controller that controls the light source to illuminate the scene with gated or modulated light (controller 126 controls light source 40 to illuminate scene 26 and light modulator 44 to modulate the illumination of scene 26, Figure 17A, Column 25, Lines 17-28, Column 12, Line 60- Column 13, Line 7) and wherein the controller gates or modulates current from the light sensitive element of a pixel in the photosurface responsive to the time dependence of the gating or modulation of the light and determines a distance to a region imaged on the pixel responsive to the gated or modulated current (controller 126 controls shutter array 244 so that each shutter element 246 individually modulates the reflected light from scene 26 reaching each detector

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element 242; different shutter elements 246 may be modulated to open and shut at the same time or different times, thus, each detector element 242 has its own distance window associated therewith depending on the modulation of the corresponding shutter element, Figure 17A, Column 25, Lines 17-28). Note that shutter array 244 is a liquid crystal shutter array (Column 25, Lines 11-13).

Yahav et al. does not disclose the circuit is controllable to modulate or gate the current without modulating or gating the incident light. However, Riches teaches a high speed imaging apparatus, in which shuttering may be mechanical, LCD, electro-optical, solid-state (as part of the CCD chip itself), column 6, lines 34-40. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD chip itself without using a shutter array in the apparatus for shuttering (modulating or gating) the current without modulating or gating the incident light on the CCD in order to reduce the size and cost of the apparatus.

Regarding claim 27, Yahav et al. discloses the controller controls the light source to illuminate the scene with a plurality of light pulses (waveform 60, Figure 3, Column 14, Lines 50-67), each having a pulse width (pulse width T, Figure 3), and wherein the controller gates pixels in the photosurface on or off at times coordinated with times at which light pulses of the plurality of light pulses are radiated (controller 126 controls shutter elements 246 to modulate to open and shut at the same time or different time, Column 25, Lines 21-28).

4. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yahav et al.

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(U. S. Patent No. 6,057,909) in view of Riches (U. S. Patent No. 6,157,409) further in view of Kozlowski et al. (U. S. Patent No. 6,697,111).

Regarding claim 2, Yahav et al. and Riches fail to specifically disclose the circuit comprises at least one amplifier, having an input and an output; a feedback capacitor separate from the light sensitive element connected between the input and output of each of the at least one amplifier; and at least one controllable connection through which current flows from the light sensitive element into the input of the at least one amplifier.

However, Kozlowski et al. teaches a pixel circuit, which comprises at least one amplifier, a feedback capacitor, and at least one controllable connection as shown in Figure 1, Column 1, Lines 30-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Yahav et al. and Riches in order to generate signal with low noise (Column 1, Lines 25-30).

Regarding claim 3, Kozlowski et al. discloses the amplifier is an operational amplifier (Figure 1).

Regarding claim 4, Kozlowski et al. discloses wherein the circuit comprises at least one data bus (a bus is connected to readout switch, Figure 1) and wherein the circuit comprises at least one address switch (read out switch, Figure 1) that connects a data bus of the at least one data bus to an output of one of the at least one amplifier, either directly or via another switch.

Allowable Subject Matter

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5. Claims 5-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

See Examiner's statement of reasons for the indication of allowable subject matter as indicated in Paper mailed on 6/17/2005.

Note that claims 7-22 previously withdrawn from consideration as a result of a species election requirement, since claim 5 is allowable, claims 7-22 now subject to being rejoined and being allowable as dependent on claim 5.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NGOCYEN VU can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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01/06/06


NGOC-YEN VU
PRIMARY EXAMINER